

JAPAN

EDICT OF GOVERNMENT

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JIS S 0012 (2000) (English): Guidelines for all people including elderly and people with disabilities -- Usability of consumer products

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The citizens of a nation must honor the laws of the land.

Fukuzawa Yukichi

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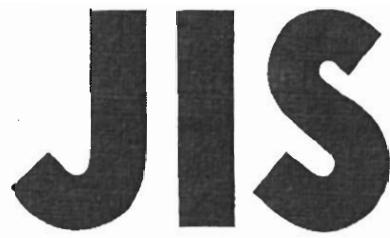


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JAPANESE
INDUSTRIAL
STANDARD

Translated and Published by
Japanese Standards Association

JIS S 0012 : 2000

**Guidelines for all people
including elderly and people
with disabilities—
Usability of consumer products**

ICS 01.110; 13.120; 97.020

Descriptors : accident prevention, domestic accidents, household equipment, old people, ergonomics

Reference number : JIS S 0012 : 2000 (E)

Foreword

This translation has been made based on the original Japanese Industrial Standard established by the Minister of International Trade and Industry through deliberations at the Japanese Industrial Standards Committee in accordance with the Industrial Standardization Law:

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Guidelines for all people including elderly and people with disabilities— Usability of consumer products

Introduction At present, consumers are surrounded by various kinds of consumer products with switches for electric operation as in electronic equipment, information and communication equipment, OA equipment, burning appliances, toys, equipment for sanitary facilities, health instruments, cameras and so on. This Japanese Industrial Standard has been developed as guidelines mainly for improving the usability of the consumer products used by elderly people and handicapped people. The application of this Standard should be properly chosen in accordance with the kinds of products and other conditions. This Standard does not apply to a special use such as for facilities use, commercial use and professional use.

1 Scope This Standard specifies the matters to be taken into account as the guidelines for the design of the consumer products (hereafter referred to as "product") used by all consumers including visually handicapped people and elderly people of weakening eyesight, aiming at improving the controllability of operating part such as electric switches.

2 Normative reference The following standard contains provisions which, through reference in this Standard, constitute provisions of this Standard. The most recent edition of the standard indicated below shall be applied.

JIS S 0011 *Guidelines for all people including elderly and people with disabilities—Marking tactile dots on consumer products*

3 Definitions For the purposes of this Standard the following definitions apply:

- a) **operation** An act to be done using the product with the intention of achieving the user's purpose.
- b) **controllability** Easiness to be understood and to be operated when the user uses the product without error.
- c) **controlling element** The generic term indicating the parts to which the user applies a force directly for its operation and the parts indicating the operational direction, operational procedure, condition of product, etc.

Example : Button, knob, handle, lamp, meter, marking letter, graphic symbol, etc.

- d) **operating part** An aggregation of controlling elements.
- e) **controlling part** Each part to which the user applies a force for the operation of the product.

4 General principles The general principles are as follows:

- a) In designing the product, the factors of controllability are taken into account from the user's view point.

In this case, such factors as "who", "what condition", "what propose", "what method" and "what operation is intended" are considered and, moreover, the mutual relation among the factors are substantially considered.

- b) The controllability is assessed at the stage of research and development of the product (for example, a stage of planning of the product, a stage of design, a stage of examination of the prototype).
- c) It is desirable that the assessment of the controllability be made by an assessor who is the nearest to the supposed user under about the same condition of actual use, because the test and assessment by means of the instruments are usually difficult.

5 Matters to be regarded

5.1 Legibility of markings The markings relating to the use of the product should be readily understood by the user in the environment in which the product is used and the following points should be taken into account:

- a) The marking (in letter, graphic symbol, pictorial letter) is of a size easy to be recognized, and colouring and colour contrast should be arranged so that the symbols can be clearly discernible from the marking surface.
- b) The marking discernible only by colour is not used.
- c) When marking, the letter face, spacing between letters and thickness of line should be such that the letters are easy to read.
- d) The marking necessary for operation is not hidden by the hand or other body part of the user who is about to operate.
- e) In addition to the visual marking, the marking by means of the tactile symbols is considered for the recognition by the sense of touch, where appropriate.
- f) In addition to the visual marking, the marking by means of sound and voice is considered for the recognition by the sense of hearing, where appropriate.
- g) The marking relating to the controlling part is given where the corresponding controlling part is nearest possible so as to show the clear correspondence.
- h) The marking by means of printing and the like is ensured not to be erased in the usual use.

5.2 Understandability of terms and graphic symbols The terms and graphic symbols relating to the use of the product should take the following points into account so as to be readily understood by the user.

- a) For indicating the function and work of the operating part, the plain and general terms by which the function and work can be easily imaged are used as far as possible. Ambiguous words, special terms or technical terms should be avoided.
- b) For indicating the function and work of the operating part, the words in Japanese should be used as a rule and, when using foreign words, it must be limited to those understood by all people regardless of age and be expressed in KATAKANA letters.

- c) An abbreviation of a combination of alphabets (acronym) is, as a rule, not used with the exception of those recognized generally or used for the name of product.
- d) For indicating the fundamental function and work of the same item, the unified term is used.
- e) When marking is given by abbreviating the term with braille in a limited space, the unified term is used for the same item.
- f) For the technical term and special term unable to be replaced with generalized daily word, if used, efforts are made to give explanation about the term in, for example, an instruction manual so that the user can understand it.
- g) The term marked on the operating part is made to coincide with the term used in the instruction manual so as to promote the understanding of the user who reads the instruction manual.
- h) When using graphic symbol, it shall put the user's understanding in the direction of promotion.

In addition, the standardized graphic symbols and generally popularized graphic symbols are used with priority, and in the case of not-popularized graphic symbols, they should be used carefully, for example, by writing the marking term of operation together with the symbols.

5.3 Location of operating parts The spatial arrangement of the operating parts should be made in such a way that the user could operate without excessive effort, taking the following matters into account:

- a) Thinking of the user's physical measurements and operational range, measures are taken so that the wrong operation caused by an unintentional touch of a part of the body to the operating part during the operation is surely prevented.
- b) Not only that the user's hand can reach the operating part, but also that the position of the operating part can be easily discerned from the external form.

5.4 Arrangement of controlling elements The controlling elements should be arranged taking the operation priority into account so as not to confuse the users and discourage them from using the equipment. The controlling parts and the markings used in the operation the user intends should be easily looked for and the operating method should also be easy to understand. For this end, the following matters should be taken into account.

- a) The positional relation between a controlling part and a part which operates by the control is understandable.
- b) Of the controlling elements, the controlling parts and the marked parts which are necessary for the intended operation can be easily distinguished.
- c) The controlling elements are of consistent arrangement taking, for example, the frequency of use and the operational procedure into account.
- d) The controlling elements are classified, according to functions, into groups of shape, size, colour, etc.

5.5 Usability of controlling elements The usability of the controlling elements should be as follows:

- a) In order that the rotational direction of the knob and the moving direction of switch are fitted for the natural recognition and movement characteristics of the user, the following matters should be taken into account:
 - 1) The operational direction and the change resulted from the operation show a relation understood easily by the user.
 - 2) The controlling elements which relate each other such as the control of "on" and "off", and "strong" and "weak" should have consistency in each direction of operation.
- b) The controlling parts the user handles directly shall be such that the operating method is understood easily, and that natural movement or body structure of the operating user is considered so that it is easy to carry out the intended operation, with the following matters taken into account:
 - 1) The shape is such that the operational method such as push, pull, or rotate is easily understood.
 - 2) The shape and size which allow the user to operate with a suitable force.
 - 3) If the controlling part is of slippery surface, an appropriate gap is formed or a shape easy to be grabbed by the finger is given.
 - 4) Controlling parts placed next to each other shall be given such shape and interval as to keep the user from touching other controlling parts unintentionally.
 - 5) The controlling part in a form of key in a sheet state, unevenness or convex symbol is given to the surface so that the position to be pushed can be tactually identified.
 - 6) When the controlling parts of the same shape are continuously arranged, a controlling part which serves as a base among them is made to be visually and tactually read.
 - 7) Compound motion such as rotating and pushing at the same time is not required, except the case of prevention of fire and other obstacles.
 - 8) For other purposes than preventing wrong operation, the operating method by which two controlling parts are operated simultaneously is not used.
 - 9) One operational function only is assigned to one controlling part as far as possible.

In the case where plural operational functions are unavoidably given to one controlling part, the linkage to the marking suitable for understanding easily the difference between the functions is considered.

- 10) It is not preferable to distinguish functions by means of the length of pushing time.

- 11) It is not preferable for the controlling parts to be activated even by a slight touch.
- 12) It is preferable to avoid the operation requiring to use both hands together.
- 13) It is preferable to be operated with a hand either right or left.

5.6 Understandability of procedure

5.6.1 Clarification of operation of fundamental function In order that the user can easily use the fundamental function of the product, the following matters should be taken into account:

- a) The operation to start the fundamental function is easily understood and discerned from the operating part.
- b) The operation to finish the fundamental function is easily understood and discerned from the operating part.

5.6.2 Consideration given in operational procedure In order for the users to learn easily how to input a number of figures and etc. when, for example, they need to set the timer or select a course of the functions, or to remember how to operate in case they have forgotten, the following matters should be taken into account:

- a) If the procedure of operation is of stratum structure placing one choice upon another, the stratum structure is kept not to be so complicated.
- b) In case of the operation done wrong, easy resetting procedures shall be provided.
- c) Suitable measures shall be provided to show the users where they are in a course of procedural order during the operation.
- d) If a limitation is placed on the time when receiving the user's operation, a proper margin of time is given so the user does not run out of time too often even when the user is not so familiar with the operation. In addition, the user has to be informed of the existence of the limitation and, moreover, the measures to make the process coming to the limitation time known should be set up.

5.7 Proper feedback In order that the user can surely recognize the result from an operation and can move to the next operation, the following matters should be taken into account:

- a) In order to clearly give information on the result from an operation (for example, "normal reception" and "error") to the user, the visual, auditory and tactile feedback is made.
- b) The feedback is made immediately after the operation. If it takes a long time for the result from the operation to show, the condition of movement (whether the function is acting or not) is informed as well.
- c) The reaction time to a series of operations is made to be free from an extreme deviation.
- d) For the operation which requires to step each operation stage, the information on what stage is stepped and what is done at present is given as well.

- e) The method of feedback is set up taking the user's perception, recognition and motor function characteristics into account.
- f) The feedback shall be easy to understand and given visually, auditorily and tactually, in combination according to the contents.
- g) In a cyclic operation in which repeating the same operation allows the user to switch a set value or a mode to another among several alternatives in a fixed order, auxiliary measures to give the user an appropriate feedback shall be provided in such a way as to make a sound or voice at the base point or make a visual indication.
- h) The coordination between the amount of operation such as how much the user rotate the knob and the amount of indication shall be set up taking the user's perception, recognition and motor function characteristics into account.

5.8 Understandability of sounds for the announcement purpose The sounds or voices used in the equipment which give the users such information as the feedback of operation, operational guide and the condition of the equipment, shall be such that the users can hear them easily in any possible environment of regular use, and that the users can easily understand the meaning of each type of sounds and recognize the difference among them. For these purposes, the following should be taken into consideration.

- a) The volume, quality and duration of the sounds shall be set to an appropriate level, taking into account people with hearing impairment, how far the announcement has to reach, noises in the ambient environment and so forth. It is also preferable that functions such as an "on" and "off" switch or the sound volume adjustment be provided.
- b) For the sounds to announce the confirmation of operation and the error in operation, the time lag between the operation and the announcement shall be the smallest.
- c) Kind, division and combination of the announced sounds are made to be as simple as possible so as to be easily discernible.

5.9 Tactile usability For push button type operating parts used for ensuring the improvement of the controllability by the users including the visually handicapped people and the elderly people of weakened eyesight by giving the convex symbols on the operating parts of the product, the following provisions shall be applied:

5.9.1 Controlling part on which convex point is marked The controlling part on which convex point is marked is as follows:

- a) The controlling parts particularly effective for the visually handicapped people.

5.9.2 Controlling part on which convex bar is marked The mark is not given on the controlling part used together for the start and for the finish (stop) of the fundamental function of the product (controlling part for on/off common use).

The use of convex bar shall be limited to the minimum necessity.

5.10 Countermeasure against and prevention of wrong operation The user's assumption with regard to how to operate the equipment and an extent of force to be applied to the controlling part differ greatly according to the user's age, degree of disabilities, experience in operation of related equipment. Therefore, as the user does not necessarily operate the equipment correctly as imagined by the designer, the design which supposes in advance a wrong operation is necessary and the following matters should be taken into account:

- a) The important controlling parts not to be carelessly operated are arranged apart from the other controlling parts and provided with measures such as locking mechanism and a cover.
- b) If a wrong operation happens, a notice or alarm which appeals to plural senses of the user such as marking, announcing sound and lamp is expressed so that the situation at that time is immediately recognized by the user.
- c) If a wrong operation should happen, it is possible for the user to easily return to the original state even in the middle of procedure and retry.

5.11 Ease of handling (informative) For ease of use, the following matters should be taken into account:

- a) **Ease of setting up and connection** Relating to portability as well, the construction ensures the easy setting up. Besides, care is taken for easy wiring.
- b) **Convenience in containing** For the users who put away such equipment the need of which is seasonal, illustration should be given on the package so the users easily know the containing place, containing order, etc.
- c) **Ease of opening and closing of door and cover** Even when having door or cover, the construction of good balance is ensured so that the user is free from a burden at the time of opening or closing.
- d) **Good portability** In the case of portable products, the handle and the like are equipped on the place suitable for keeping the weight balance of the product. For heavy products, the casters and the like are to be provided.
- e) **Ease of maintenance** If the daily maintenance is necessary, disassembly and assembly are easy, and the materials from which stains, if attached, can easily be wiped off are used.
- f) **Marking of type number of products** The type number of the product is clearly marked where it is easy to notice.

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